



Conservation Curriculum

OUTDOOR LEARNING EXPERIENCES

This issue of the curriculum insert has a modified format. Instead of grade level specific activities, we are providing you with information that may be useful for different types of field trips. Each activity can be adjusted for grade level.

Missouri FORESTKEEPERS Network

Missouri Forestkeepers Network was started in 1996 as a program to monitor forest health in the state. It's designed to educate Missourians about the care and management of Missouri's trees and forests and to enlist volunteer support in monitoring forest health.

For more information or to join the Missouri Forestkeeper Network, call toll-free, (888) 9-FOREST (888-936-7378) or check out the Forest ReLeaf Website, www.moreleaf.org.

STREAM TEAMS

Missouri's Stream Team Program is an excellent opportunity to get involved and show you care about Missouri's streams. You can take part in stream clean-ups, do water quality monitoring and many other projects for stream conservation.

If you are interested in starting a Stream Team, call 1-800-781-1989 (message system) or check out the web site, www.mostreamteam.org

Show-Me Conservation Outdoor Classroom Grants

**Application Deadline -
May 3, 2002**

School administrators across the state received specific information detailing the two types of available grants:

Development Grant of up to \$2,500

Enhancement Grant of up to \$500

Have questions? Call Syd Hime
573-751-4115 ext 3370

Teacher resources

Two excellent tools for planning field trips are offered for sale through the Missouri Department of Conservation:

CONSERVATION HIKING TRAILS

\$4.00 cost

A variety of trails are available on conservation grounds throughout the state. You can take your classes to forest, prairie, glades and savannas, as well as aquatic regions with streams, lakes or wetlands. The updated version of this book lists 86 of Missouri's most popular trails to explore.

MISSOURI CONSERVATION ATLAS 2001 EDITION

\$16.00 cost

This is a comprehensive guide to Missouri's beautiful and abundant conservation areas. The guide contains 114 detailed county maps. It includes a fact-filled index listing activities, facilities, natural features, handicap access and other useful information. This is sure to enhance your enjoyment of the outdoors. 264 pages

media loan list

You may borrow the following item by contacting our Media Librarian at (573) 751-4115 x3837, fax (573) 751-2260 or write: Media Librarian, Missouri Department of Conservation, PO Box 180, Jefferson City, MO 65102-0180.

EXPLORING OUTDOOR MISSOURI

26 min VHS video

Explore Missouri's scenic lands where a variety of recreational opportunities await. See great places to fish, hike, observe nature and more. Plus, learn what to take with you for an outstanding outdoor adventure.

IS IT DEAD YET?

Diagram of a Rotting Log

Dead trees are recycled back into the forest soil through decomposition. The stages of decomposition may be classified in three main categories:

Invaders- Invaders attack dead, dying or weakened trees and start the process of decomposition. Wood-eating insects enter the tree by boring holes into the bark. They pave the way for other “invaders,” such as bacteria and fungi, that dissolve the wood structure and allow moisture to enter. This moisture makes the tree a suitable place for mosses, lichens and other plants to live. As they grow, they penetrate the wood, causing it to break apart and decompose even further. Many insects find this an ideal environment for laying their eggs.

Consumers- Fungi and bacteria provide many nutrients for consumers, such as insect larvae, which feed on other organisms and their remains. Insects like the moist habitat of the rotting log where they can find shelter and food. At this stage of decomposition, more plants, insects and animals are inhabiting the tree, causing further decay. Some wood-eating insects leave the decaying tree in search of newly fallen logs.

Scavengers- Scavengers eat dead plant and animal material and often choose decaying logs for their food and home. Snails and slugs come in and break down the log until it has virtually disintegrated. At this point, it is covered with plant debris, new seedlings and leaves. It is almost impossible to differentiate the decayed log from the litter of the forest floor.

The Fallen Log: Activity 1

Divide the class into teams of four or five students. Each team will examine a different fallen tree and keep a record of their findings. Records include answers to these questions:

- Does the fallen log appear to have died recently or some time ago? How can you tell?
- What kinds of plants are growing on the log?
- What kinds of animals are found

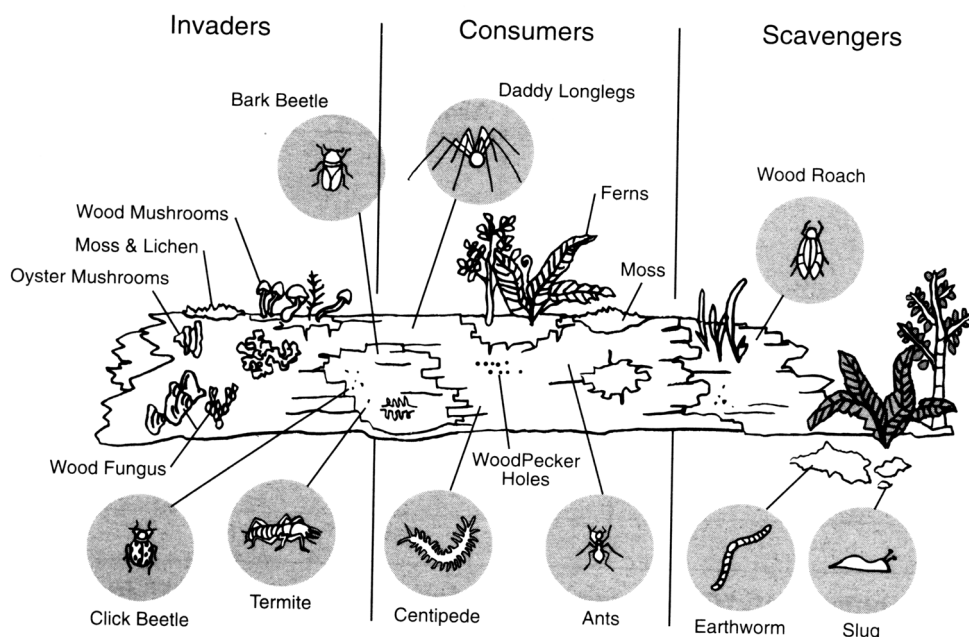
under the bark? Inside the wood? Under the log?

- What other evidence of decomposition do you see?
- What evidence of animal activity do you see on or around the log?
- What other organisms are found near the log (under the surrounding leaves or rocks)?
- What may have caused the death of the tree you are studying?

Each team presents their findings to the class. After each presentation, students should discuss these questions and record in their journals.

- What similarities and differences were there between logs? How might the differences be explained?
- Why is it important that the logs and other organisms of the forest eventually decompose?
- Produce at least one example of a food chain that is taking place in your log.

Credit: Adapted from the activity, “The Fallen Log,” in Project Learning Tree and “Adopt a Forest” in Project Learning Tree’s high school unit “The Changing Forest: Forest Ecology,” American Forest Foundation.



Nature Journaling

Lewis and Clark, John J. Audubon and Aldo Leopold are only a few of the notable explorers that trekked across Missouri and other parts of the United States of America recording their findings. Much of what we know about the history of Missouri's habitat comes from writing or artwork by pioneers fascinated with the land. We call this special type of record keeping "nature journaling."

SHOW-ME STANDARDS

Performance: 1.6, 1.9, 2.1, 2.2 Knowledge: CA1, CA4, FA1, FA4, FA5, SC3, SC4, MA2

PROCEDURE:

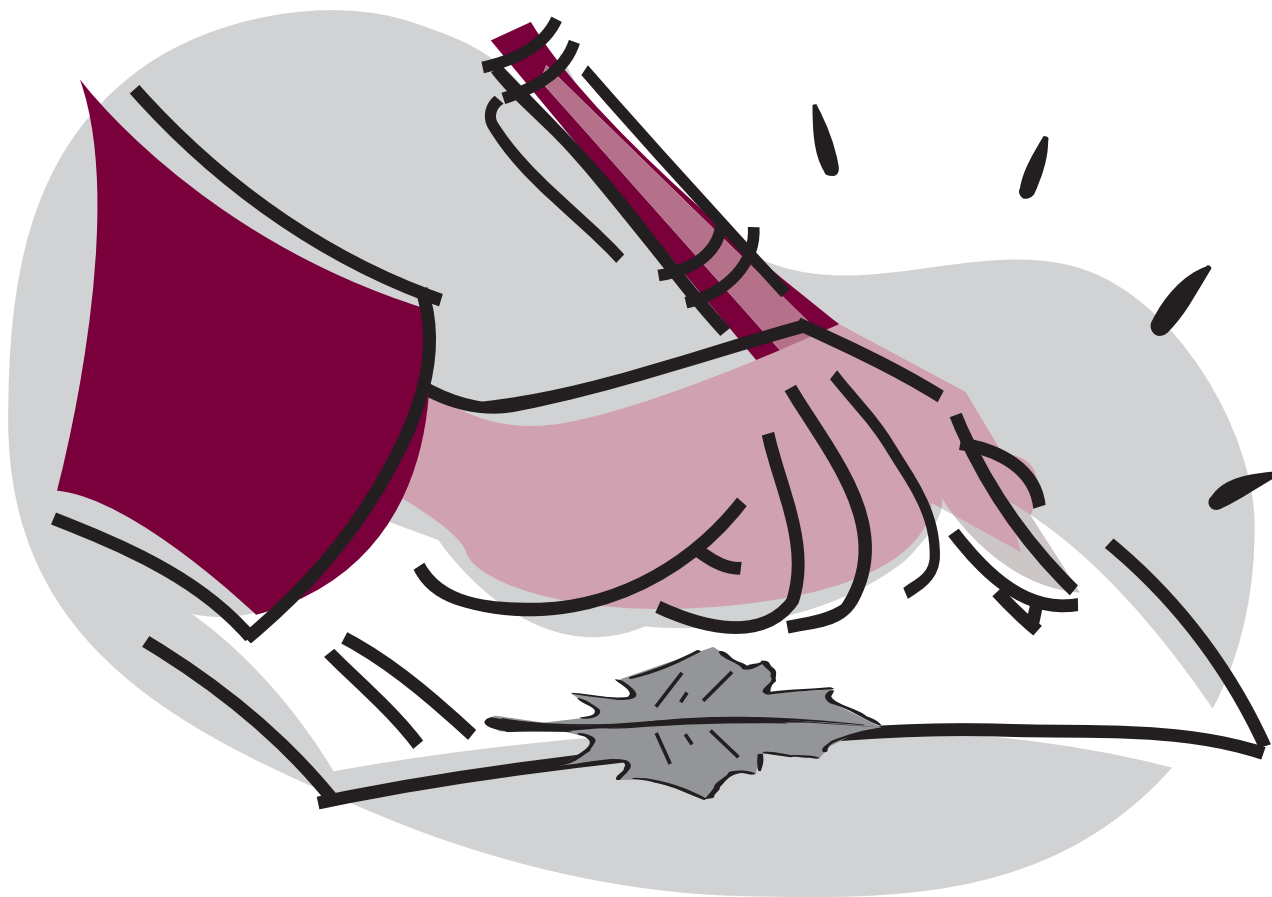
Warm-Up: As with any expedition, adequate preparation is essential. Exercises below are designed to strengthen the student's observation skills.

1. First, have the students draw a circle using their whole arm. Make sure the circle fills the entire sheet of paper. Keep going over the circle. Each time, try to make it a perfect circle. After 30 seconds or so change directions. This is a warm-up to get your hand and eye working together.

2. Next, draw a natural object such as a bone, leaf, bark, etc. that has been collected from outdoors ahead of time. Have students save this for future reference.

3. **Gesture sketching** is a good way to summarize information quickly. Give the students 30 seconds to draw any object completely. This is obviously not enough time to complete the task, but crucial information can be observed quickly. Some potential subjects may not linger long enough for a full portrait. Do as many of these as needed.

4. **Blind contour** is another tool that helps students develop their observation skills. For this, time is not a factor. Students will draw natural objects without looking at their paper. After placing the object where they can see it clearly, the student sketches an outline of the object. The only time they are allowed to look at their work is if they stop and need to place their pencil back on the paper. The images created will not look very good and they should not. Detail, however, will be intense! That is the point. A good sign this warm-up is working well is total silence.



CREATING your JOURNAL

1. Students need to have a journal. Three-ring binders with loose leaf paper, journal books or 8.5 X 14 paper stacked, folded in half and stapled into a book can be used for a journal. Be creative, allow students to decorate the cover of their journal to make it more personal. Students will also need writing tools.

2. Here is an assortment of nature journaling exercises that may provide some direction.

CREATIVE WRITING: The study of an organism can be enhanced by writing a story drawn from the information discussed in class. For example, after discussing trees and their use as homes for many animals, you may suggest a story that describes "Things a Tree Sees." The story may incorporate pictures or vocabulary words you have chosen.

LANDSCAPE: This is a great way to get students to pay attention to what is around them. Have them describe the landscape of the school yard or scenes from a field trip. Have them label interesting parts.

OUTDOOR POETRY: Inspiration may occur from an outdoor classroom or while on a field trip. Get students to write poetry inspired by the outdoors.

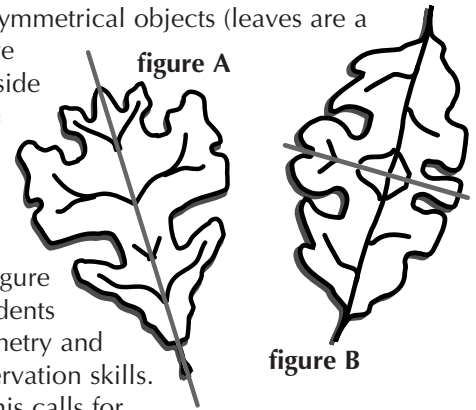
ANIMAL/PLANT PROFILES: Have students keep a weekly log profiling a particular nature item. This can give a short, but informative, look into the life of some unknown

creature. Have them draw their nature item and try to answer these questions in their animal profile: 1) Where does it live? 2) When is it active? and 3) What does it eat? In the plant profile, have them answer the following questions: 1) Where does it live? 2) What could eat this plant? 3) What are the fruit or seeds like? 4) How tall does it grow? and 5) Who pollinates this plant?

SYMMETRY: Find symmetrical objects (leaves are a simple choice) have them draw the left side of the object. Then

take away the object and have them draw the opposite side as a mirror image (see figure A). This allows students to understand symmetry and increases their observation skills.

A modification of this calls for changing the line of symmetry so the mirror images will not be complimentary (see figure B).



ASSESSMENT: Assignments can be made daily and collected every two weeks. You can then spot grade a few key assignments, thus reducing your work load. The students will not know which assignment you will or will not grade.

ASSESSING THE FIELD TRIP

by: Ned Miller, Heart of Missouri Regional Professional Development Center
Leslie Smith, Osage High School,
Lake Ozark, MO

Taking time to evaluate an action project helps students understand what they have accomplished. Listed below are ideas for developing relevant assessments.

All Students

Performance assessments – The best strategy is to have an ongoing performance assessment that starts in the classroom and continues on the field trip, where students find information and develop skills that are unique to the field trip site. The assessment is concluded in the classroom.

Younger Students

- Create drawings or posters made individually or in groups

depicting specific items or ideas for the field trip

- Create a game using the concepts learned
- Create performances or exhibitions
- Develop flow charts about topics from the trip
- Create venn diagrams connecting items or ideas from the trip to other areas of their life

Older students

- Any of the above when appropriate
- Journals or Logs- Field Log, Learning Log, Reflective Log- all are valuable assessment tools. *Note: providing students with a checklist or benchmark for items to go into their journal is imperative for quality.*
- FAQ (Frequently Asked Questions) Direct students to write a pamphlet or brochure for visitors that covers all topics. Challenge them to experiment, design, test, interpret results, stretch their minds and explore new topics.

AQUATIC SAMPLING

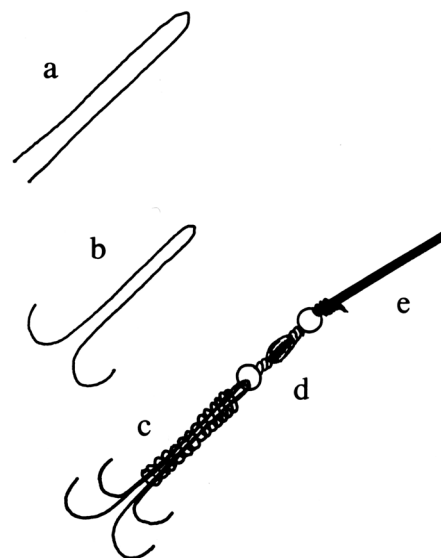
How to construct your own aquatic sampling equipment.

WEED GRAPPLE

A *weed grapple* is used to collect samples of submerged aquatic plants that are not otherwise accessible from shore. To construct a weed grapple, you will need:

- two 3-ft. lengths of No. 9 wire (or two heavy coat hangers that have been taken apart- use wire cutters to remove the hook and wire twist and then straighten the hangers)
- lightweight, rust-proof wire
- a large, brass fishing swivel
- a 25-ft. length of nylon cord
- a pair of pliers
- a large lead sinker (optional)

1. Use pliers to bend each wire in half (a) and then form a large hook at both ends of each wire (b).
2. Securely fasten the two sections together with lightweight wire so that the grapple has four arms or hooks (c).
3. Use lightweight wire to attach a swivel to the top loop of the grapple (d). The swivel prevents the line from twisting.
4. Tie one end of the nylon cord to the swivel (e).
5. Optional: A large lead sinker may be attached to the grapple so that it will sink to the bottom of the water more easily.



How to use the weed grapple:

Toss the grapple into the water and allow it to settle to the bottom. Be sure to hold the free end of the cord to avoid losing the grapple. Retrieve the grapple, pulling it along the bottom of the pond or stream. Examine the vegetation that has been hooked and look for vegetation types and animal life (larva, eggs, inadvertently trapped adult invertebrates, etc.)

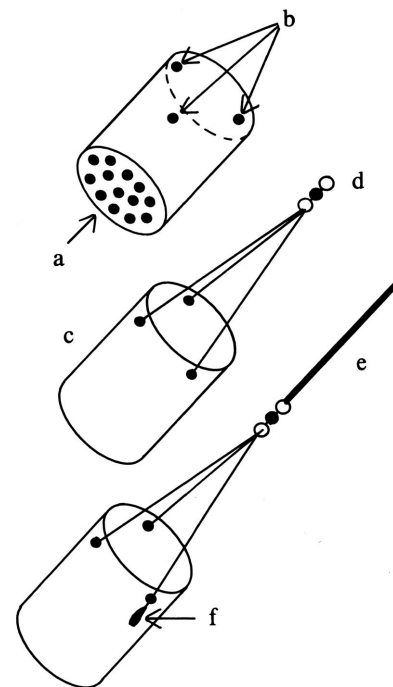
CAUTION: Use the weed grapple safely. Toss it so as to avoid others working near you.

BOTTOM DREDGE

A *bottom dredge* is used to collect mud and debris from the bottom of a body of water. To construct a bottom dredge, you will need:

- one empty can (coffee cans are ideal) with one end removed and the burrs filed off
- medium-weight wire
- a large brass fishing swivel
- an 8 oz. lead sinker
- hammer and nail
- wire cutters

1. Use the hammer and nail to make several holes in the bottom of the can (a). Make three equally-spaced holes in the side of the upper edge of the can (b).
2. Cut three 8-10 inch lengths of medium-weight wire. Attach each piece of wire to one of the three holes at the top of the can (c). Attach the fishing swivel to the wires where they come together (d).
3. Attach the heavy cord to the swivel (e).
4. Attach the lead sinker to one side of the can (f).



How to use the bottom dredge:

Toss the dredge into the water and allow it to settle to the bottom. Be sure to hold the free end of the cord to avoid losing the dredge. Retrieve the dredge, pulling it along the bottom of the pond or stream. The dredge scrapes mud and debris samples from the bottom as excess water drains through the holes. Examine mud and debris samples carefully with a hand lens, looking for minute movement and other signs of animal life.

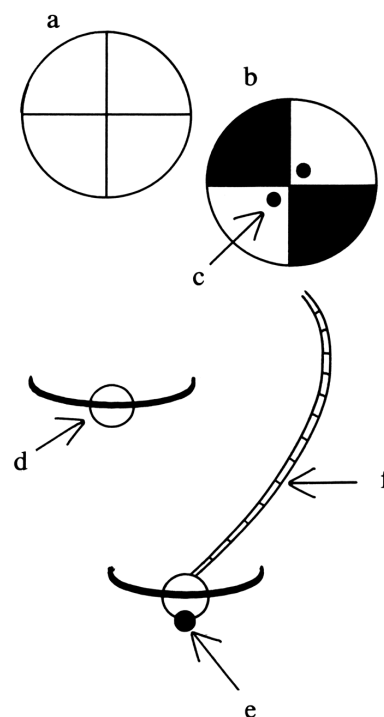
CAUTION: Use the bottom dredge safely. Toss it so as to avoid others working near you.

SECCHI DISC

A *Secchi disc* is used to determine water visibility and light penetration. To construct a Secchi disc, you will need:

- a lid cut from one end of a 3 lb. coffee can, with burrs filed off
- white and black water-proof paint
- hammer and nail
- medium-weight wire
- 8 oz. lead sinker
- pre-measured and marked cord (cord marked at one inch intervals with water-proof ink)

1. Divide the lid into four equal parts (a). Paint the quadrants, alternating with black and white paint (b).
2. Use the hammer and nail to make two holes near the center of the lid (c). Use the medium-weight wire to make a loop through the holes (d).
3. Attach the lead sinker to the wire loop on the bottom of the disc (e).
4. Attach the pre-measured and marked cord to the wire loop on the top of the disc (f).



How to use the Secchi disc:

Lower the Secchi disc into the water just until it can no longer be seen. Note the water mark on the line and count the increments to obtain the measurement. Record the measurement for water visibility and light penetration.